

AMENDMENTS TO THE CLAIMS:

1. (Currently amended) A method of manufacturing a crystal of a III-V compound of a nitride system, the method comprising:

growing a crystal of a III-V compound of the nitride system having a predetermined thickness on a surface selected from a group of surfaces consisting of a surface of a basal body and a surface of a base layer;

wherein the growth step comprises:

forming a first III-V nitride pattern in one position in the crystal in a direction of a thickness of the crystal, the first pattern including a plurality of first elements distributed in a lateral direction with respect to the crystal at a pitch, each of the first elements forming an elongate stripe extending in a longitudinal direction that is substantially orthogonal to said lateral direction and each of the first elements having at least one width measured in the lateral direction;

depositing an intermediate layer directly on a surface of the first pattern;

and

forming a second III-V nitride pattern in another position in the crystal in the direction of the thickness of the crystal directly on a surface of said intermediate layer, the second pattern including a plurality of second elements distributed in the lateral direction with respect to the crystal at a pitch, each of the second elements forming an elongate stripe extending in the longitudinal direction and each of the second elements having at least one width measured in the lateral direction;

wherein the pitch of said first pattern and the pitch of said second pattern are different; and

wherein the second pattern partly overlies and partly does not overlie said first pattern in the direction of the thickness of the crystal due at least in part to the different pitches of the first pattern and the second pattern.

2. (Previously presented) A method of manufacturing a crystal of a III-V compound of a nitride system as claimed in claim 1,

wherein the width measured in the lateral direction of at least one of said first pattern elements and the width measured in the lateral direction of at least one of said second pattern elements are different; and

wherein the second pattern partly overlies and partly does not overlie said first pattern in the direction of the thickness of the crystal due at least in part to said different widths.

3. (Canceled)

4. (Previously presented) A method of manufacturing a crystal of a III-V compound of a nitride system as claimed in claim 1,

wherein a relationship between the pitch of the first pattern and the pitch of the second pattern is:

$$0.1 \mu\text{m} < p_1 \times p_2 / |p_2 - p_1| < 5000 \mu\text{m}$$

where p_1 denotes the pitch of the first pattern and p_2 denotes the pitch of the second pattern.

5. (Previously presented) A method of manufacturing a crystal of a III-V compound of a nitride system as claimed in claim 1,

wherein at least one of the first and second patterns has pattern elements arranged in a plurality of different pitches measured in the lateral direction with respect to the crystal.

6. (Previously presented) A method of manufacturing a crystal of a III-V compound of a nitride system as claimed in claim 1,

wherein the second pattern has at least three different pitches measured in a lateral direction with respect to the crystal.

7. (Canceled)

8. (Previously presented) A method of manufacturing a crystal of a III-V compound of a nitride system comprising:

growing a crystal of a III-V compound of the nitride system having a predetermined thickness on a surface of a basal body,

wherein the growth step comprises:

forming a first pattern including a plurality of first pattern elements in a first position in the crystal in the direction of the thickness of the crystal, the first pattern elements being distributed in a lateral direction with respect to the crystal and in a longitudinal direction with respect to the crystal that is substantially orthogonal to the lateral direction so that a space separates each set of adjacent first pattern elements of the plurality of first pattern elements in the lateral direction and in the longitudinal direction, the first pattern having a lateral pitch measured in the lateral direction and a longitudinal pitch measured in the longitudinal direction that is substantially the same as the lateral pitch; and

forming a second pattern in a second position in the crystal in the direction of the thickness of the crystal including a plurality of longitudinal pattern elements extending in the longitudinal direction and a plurality of lateral pattern elements extending in the lateral direction to intersect the longitudinal pattern elements, the intersecting elements forming a plurality of spaces between them that are aligned in the lateral direction and in the longitudinal direction, the plurality of longitudinal elements having a pitch measured in the lateral direction and the plurality of lateral elements having a pitch measured in the longitudinal direction that is substantially the same as the lateral pitch;

wherein the pitches of the first pattern are different from the pitches of the second pattern;

wherein the second pattern partly overlies and partly does not overlie the first pattern in the direction of the thickness of the crystal due at least in part to the different pitches; and

wherein each of the first and second patterns is arranged in a respective plane and each plane is substantially parallel to the surface of the basal body.

9. (Previously presented) A method of manufacturing a crystal of a III-V compound of a nitride system as claimed in claim 8,

wherein each of said first pattern elements and each of said spaces formed by the elements of the second pattern is shaped as a rhombus having no interior right angles.

10. (Previously presented) A method of manufacturing a crystal of a III-V compound of a nitride system as claimed in claim 8,

wherein each of said first pattern elements and each of said spaces formed by the elements of the second pattern has a shape selected from a group of shapes consisting of parallelogram, hexagon, and triangle.

11. (Currently amended) A method of manufacturing a crystal of a III-V compound of a nitride system as claimed in claim 1,

wherein the growth step further comprises:

a first pattern formation step in which the first pattern is formed one of directly on the basal body and on the basal body with ~~[[a]]~~ the base layer in between;

a first growth step in which ~~an~~ the intermediate layer as part of the crystal is deposited on one of the surface of the basal body and on ~~[[a]]~~ the surface of the base layer with the first pattern formed thereon; ~~a second pattern formation step in which the second pattern is formed on a surface of the intermediate layer deposited in the first growth step; and~~

a second growth step in which a top layer as part of the crystal is deposited on the surface of the intermediate layer with the second pattern formed thereon.

12. (Previously presented) A method of manufacturing a crystal of a III-V compound of a nitride system as claimed in claim 11,

wherein at least one of the first pattern and the second pattern is comprised of a masking material.

13. (Previously presented) A method of manufacturing a crystal of a III-V compound of a nitride system as claimed in claim 12,

wherein the masking material includes silicon (Si) and at least one selected from the group consisting of oxygen (O) and nitrogen (N).

14. (Previously presented) A method of manufacturing a crystal of a III-V compound of a nitride system as claimed in claim 11,

wherein the basal body comprises one of sapphire (Al_2O_3), silicon (Si), silicon carbide (SiC), gallium arsenide (GaAs), magnesium aluminum composite oxide (MgAl_2O_4), lithium gallium composite dioxide (LiGaO_2) and gallium nitride (GaN).

15. (Previously presented) A method of manufacturing a crystal of a III-V compound of a nitride system as claimed in claim 11,

wherein the base layer is deposited by growing a III-V compound of the nitride system on the basal body.

16. (Previously presented) A method of manufacturing a crystal of a III-V compound of a nitride system as claimed in claim 15,

wherein the first pattern formation step comprises:

forming the first pattern by deposition of a masking material on the surface of the base layer,

and the growth step further comprises:

between the first pattern formation step and the first growth step,

a step of selectively etching the base layer using the first pattern as a mask.

17. (Previously presented) A method of manufacturing a crystal of a III-V compound of a nitride system as claimed in claim 15,
wherein the second pattern formation step comprises:
forming the second pattern by deposition of a masking material on the intermediate layer deposited in the first growth step,
and the growth step further comprises:
between the second pattern formation step and the second growth step,
a step of selectively etching the intermediate layer using the second pattern as a mask; and
a step of removing the masking material of the second pattern.

18. (Previously presented) A method of manufacturing a crystal of a III-V compound of a nitride system as claimed in claim 11,
wherein the first pattern formation step comprises:
forming the first pattern by forming an indentation in one of the surface of the basal body and in the surface of the base layer.

19. (Previously presented) A method of manufacturing a crystal of a III-V compound of a nitride system as claimed in claim 11,
wherein the second pattern formation step comprises:
forming the second pattern by forming an indentation in the surface of the intermediate layer deposited in the first growth step.

20. (Previously presented) A method of manufacturing a crystal of a III-V compound of a nitride system as claimed in claim 11, further comprising:
separating at least the basal body from the crystal.

21. (Canceled)

22. (Canceled)

23. (Previously presented) A method of manufacturing a device by forming a device film on a surface of one of a crystal substrate and a crystal film, the method comprising:

forming one of the crystal substrate and the crystal film by growing a crystal of a III-V compound of a nitride system having a thickness on a surface of a basal body; and

forming the device film on one of the crystal substrate and the crystal film, the device film having a light-emitting portion including a cladding layer having a protrusion, a contact layer formed on the cladding layer only above the protrusion, and an electrode formed on the contact layer,

wherein the growth step comprises:

forming a first pattern including a plurality of first elements distributed in a lateral direction with respect to the crystal in at least one pitch, the first pattern being formed in one position in the crystal in a direction of the thickness of the crystal, each of the first elements having at least one width measured in the lateral direction; and

forming a second pattern including a plurality of second elements distributed in the lateral direction in at least one pitch, the second pattern being formed in another position in the crystal in the direction of the thickness of the crystal, each of the second elements having at least one width measured in the lateral direction;

wherein the second pattern partly overlies and partly does not overlie the first pattern in the direction of the thickness of the crystal; and

wherein said light-emitting portion overlies a region of the crystal where the second pattern overlies the first pattern so that dislocations that may form in the crystal adjacent the basal body generally do not reach said light-emitting portion.

24. (Previously presented) A method of manufacturing a device as claimed in claim 23 wherein,

the second pattern partly overlies and partly does not overlie the first pattern in the direction of the thickness of the crystal due at least in part to a variance between the pitch of the first pattern and the pitch of the second pattern and/or a variance between the width measured in the lateral direction of at least one of said first pattern elements and the width measured in the lateral direction of at least one of said second pattern elements.

25. (Currently amended) A method of manufacturing a crystal of a III-V compound of a nitride system, the method comprising:

growing a crystal of a III-V compound of the nitride system having a predetermined thickness on a surface selected from a group of surfaces consisting of a surface of a basal body and a surface of a base layer,

wherein the growth step comprises:

forming a first pattern in one position in the crystal in a direction of a thickness of the crystal, the first pattern including a plurality of first elements distributed in a lateral direction with respect to the crystal at a pitch, each of the first elements forming an elongate stripe extending in a longitudinal direction that is substantially orthogonal to said lateral direction and each of the first elements having at least one width measured in the lateral direction; and

forming a second pattern in another position in the crystal in the direction of the thickness of the crystal, the second pattern including a plurality of second elements distributed in the lateral direction with respect to the crystal at a pitch, each of the second elements forming an elongate stripe extending in the longitudinal direction and each of the second elements having at least one width measured in the lateral direction;

wherein the crystal is substantially free of an active layer between the first pattern and the second pattern;

wherein the width measured in the lateral direction of at least one of said first pattern elements is different than the width measured in the lateral direction of at least one of said second pattern elements; and

wherein said second pattern partly overlies and partly does not overlie said first pattern in the direction of the thickness of the crystal due at least in part to the different widths.

26. (Canceled)

27. (Previously presented) A method of manufacturing a crystal of a III-V compound of a nitride system as claimed in claim 8, wherein forming said first pattern includes forming the first pattern including a III-V nitride and/or forming said second pattern includes forming the second pattern including a III-V nitride.

28. (Previously presented) A method of manufacturing a crystal of a III-V compound of a nitride system as claimed in claim 23, wherein forming said first pattern includes forming the first pattern including a III-V nitride and/or forming said second pattern includes forming the second pattern including a III-V nitride.